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The vital statistics of old
age

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The Vital Statistics of Old Age

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BY
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NEW YORK

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THE VITAL STATISTICS OF OLD AGE.*

By LOUIS I. DUBLIN, PH. D.,

Statistician, Metropolitan Life Insurance Company,
New York.

For the purposes of this discussion I shall set age sixty-five years as the threshold of old age. This is in general agreement with the best custom, for it is at this point that the rates of mortality and morbidity both show a decided increase. The age of sixty-five years is also the time when most superannuation allowances begin, whether such provision is made through state funds or voluntarily by private employers. According to the 1910 census there were in continental United States a little under four million persons aged sixty-five years and over. At the present time there are probably close to four and one half millions at these ages. They form 4.3 per cent. of the total population and it is interesting to note that this proportion is increasing slowly, having been 3.9 per cent. in 1890 and 4.1 per cent. in 1900. Of the total, 92.2 per cent. were white and 7.8 were colored, although all facts referring to the older ages of the colored population are subject to slight error. Thirty per cent. of the aged are foreign born. It is among the foreign born that the old form the highest proportion, nearly nine per cent., while among the native population of native parentage only 4.5 per cent. are found at these ages.

Of the four and one half million old persons, 70.7 per cent. are concentrated in the ten year period between sixty-five and seventy-four years and twenty-five per cent. more between the ages seventy-five and eighty-four. As we examine the later age periods, the numbers and proportions become rapidly smaller

*Read before the Medical Association of Greater New York, February 19, 1917.

until in the age period ninety-five years and over there are only about 11,000 persons, forming 0.3 per cent. of the total population over sixty-five years. In 1910 there were 3,555 centenarians reported. Of this number more than three-fourths were colored, which is far in excess of the relative proportion of colored in the population. This fact, combined with the results of several investigations made by census officials, shows very clearly that the stated number of centenarians is grossly exaggerated. Many pretend to have attained the hundred year mark who have no right to that distinction. In each succeeding census, however, the proportion of centenarians reported has become much smaller.

The statistics of old age given above do not apply equally to the two sexes, as is shown in the following table:

TABLE I.
NUMBER AND PERCENTAGE OF POPULATION AGED SIXTY-FIVE YEARS AND OVER IN EACH FIVE YEAR AGE PERIOD AFTER AGE SIXTY-FIVE, UNITED STATES, 1910.

Age period.	Males and females.		Males.		Females.	
	Number.	Per cent.	Number.	Per cent.	Number.	Per cent.
Total:						
65 years and over	3,049,524	100.0	1,985,976	100.0	1,063,548	100.0
65-69	1,679,593	42.5	863,094	43.5	815,599	41.5
70-74	1,113,738	28.2	561,644	28.3	552,094	28.1
75-79	667,302	16.0	331,280	16.7	335,022	17.1
80-84	321,254	8.1	153,748	7.7	167,506	8.6
85-89	122,818	3.1	56,335	2.8	66,483	3.4
90-94	33,473	.8	14,553	.7	18,920	1.0
95 and over	10,946	.3	4,425	.2	6,521	.3

The entire group sixty-five and over is composed of about the same number of males and females. This is remarkable, in view of the fact that the population of the country has been increased rapidly in recent years through the immigration of males at the earlier ages. In the age period fifty to fifty-four years, there were, in 1910, 118 males for every 100 females. In the age period sixty-five to sixty-nine, there were 106 males to 100 females. Between seventy-five and seventy-nine years the relations were reversed and thereafter the number of females was greatly in excess of the number of males. After age ninety, for example, there were four females

for every three males. The increasing proportion of females to males at the older ages is clearly the result of the much lower mortality of the females at the advanced ages. Table II presents some statistics of mortality by sex at these higher ages.

TABLE II.
DEATHS PER 1,000 LIVING, ORIGINAL REGISTRATION STATES, UNITED STATES, 1909 TO 1911, BY SEX AND BY AGE PERIODS SIXTY-FIVE YEARS AND OVER.

Age period.	Males and females.		Males.	Females.
	Number.	Per 1,000.	Number.	Per 1,000.
65-69 years	48.6	51.7	43.5	43.5
70-74 years	71.5	75.1	68.2	68.2
75-79 years	106.2	112.8	106.5	106.5
80-84 years	160.9	167.0	158.7	158.7
85-89 years	225.3	234.4	218.9	218.9
90-94 years	313.2	315.4	310.7	310.7
95-99 years	414.7	410.3	417.5	417.5
100 years and over	540.5	559.3	532.6	532.6

In 1914, the mortality rate in the registration area of the United States for persons sixty-five years and over was 78.6 per thousand living. In other words, one out of every twelve died in the course of the year. The situation is somewhat analogous to that found in the first year of life when one in every ten die. The probability of dying increases very rapidly with age. In the period sixty-five to sixty-nine years, during the triennium 1909 to 1911, the rate is 48.6 per thousand, or less than five per cent. Between seventy-five and seventy-nine it is 106.2 per thousand; between eighty-five and eighty-nine, 225.3 per thousand, or one out of every five persons living. Thereafter, the rates are based on such small numbers of living and dying that no significance can be attached to the figures except that the living and the dead tend to approximate one another in number. As I have already said, the death rates for the males are uniformly higher than those for females. This fact is notable throughout life, beginning with infancy and continuing without exception through all the age periods.

A more interesting picture of vitality is perhaps presented by the facts concerning the expectation of life at these older ages (Table III). According to the tables recently prepared by the Bureau of the Census, persons at age sixty-five years may expect an after

lifetime of 11.6 years. This, of course, is an average and applies to no particular individual. At age seventy the expectation is decreased to 9.1 years; at eighty, it is only five and one quarter years; at ninety, only three years of after lifetime remain. Again the expectations are greater for females than for males.

TABLE III.
EXPECTATION OF LIFE IN YEARS, BY SEX, AT SPECIFIED AGES SIXTY-FIVE YEARS AND OVER, ORIGINAL REGISTRATION STATES, UNITED STATES, 1909 TO 1911.

Age.	Males and females.	Males.	Females.
65	11.60	11.24	11.96
70	9.11	8.83	9.38
75	6.99	6.78	7.20
80	5.25	5.10	5.37
85	4.00	3.90	4.08
90	3.03	3.01	3.05
95	2.35	2.35	2.34
100	1.85	1.81	1.91

The diseases and conditions which cause death at the later ages present a picture very different from that at any other age period. Certain of the causes are preeminently those of old age and certain others increase very rapidly in importance at these ages. Reference to Table IV shows that of the 245,635 deaths of persons sixty-five years of age and over that occurred in 1914 in the registration area of the United States, 49,414, or 20.1 per cent., were from organic diseases of the heart. This group of diseases stands first in the list of conditions causing death in old age. Cerebral hemorrhage and apoplexy together account for 30,887 deaths, or 12.6 per cent; Bright's disease is responsible for 28,544 deaths, or 11.6 per cent. of the total; cancer caused 20,014 deaths, or 8.1 per cent., and pneumonia, all forms, almost as many as cancer, 19,155. Together these five causes are responsible for 60.2 per cent. of all the deaths occurring after age sixty-five years. Tuberculosis, which is, of course, most prominent in the adult working periods of life, plays, nevertheless, an important part in the later periods. Thus 2.3 per cent. of the deaths are from various forms of tuberculosis. It is an interesting fact that the death rate from

tuberculosis per 100,000 living at these ages is almost as high as it is in the age period twenty-five to thirty-four. Its relative importance is overshadowed only by the increased mortality from the other causes. Suicide shows its highest rate in old age, thirty-six per 100,000 living after sixty-five die by their own hand. In 1914 about five per cent. of all the deaths after sixty-five years were assigned to "senility," but many of these deaths are clearly chargeable to more definite conditions such as Bright's disease, heart disease, and arteriosclerosis. It is encouraging to find that physicians are beginning to realize the importance of making more definite statements of causes of death on their certificates as is shown by the declining rate for senility.

TABLE IV.
DEATHS AND DEATH RATES PER 100,000 LIVING, CHIEF CAUSES OF DEATH AT AGES SIXTY-FIVE YEARS AND OVER, REGISTRATION AREA OF THE UNITED STATES, 1914.
Ages 65 years and over. 65 to 74 years.

Cause of death and sex:	Deaths.	Per cent. of all causes.	Deaths.	Per cent. of all causes.
All causes—total	245,635	100.0	7,859.6	100.0
Males	128,597	100.0	8,163.7	100.0
Females	116,038	100.0	7,695.8	100.0
Tuberculosis—all forms ..	5,647	2.3	180.7	2.3
Males	3,150	2.5	205.1	2.5
Females	2,497	2.1	175.6	2.3
Cancer—all forms	20,014	8.1	640.4	8.1
Males	9,070	7.2	589.5	7.2
Females	10,944	9.4	650.9	8.5
Cerebral hemorrhage, apoplexy	30,887	12.6	988.3	12.6
Males	15,073	12.2	999.4	12.4
Females	15,814	13.6	978.8	12.6
Organic disease of heart ..	49,414	20.1	1,581.1	20.1
Males	25,524	20.3	1,659.0	20.3
Females	23,890	20.6	1,502.5	19.6
Disease of arteries	15,076	6.1	383.2	4.9
Males	6,786	5.4	441.1	5.4
Females	8,290	7.1	342.1	4.4
Pneumonia—all forms	19,155	7.8	612.9	7.8
Males	8,774	7.0	570.3	7.0
Females	10,381	8.6	642.6	8.4
Bright's disease	28,544	11.6	913.3	11.6
Males	16,207	12.6	1,053.4	12.6
Females	12,337	10.5	664.4	8.6
Senility	12,762	5.2	408.3	5.2
Males	5,683	4.5	368.5	4.5
Females	7,139	6.1	449.8	5.8
Suicide	1,118	.5	35.8	.5
Males	947	.8	61.6	.8
Females	171	.1	10.8	.1

Summarizing the above facts we may say that after sixty-five years we are concerned not so much with infection or with external agencies, but rather with the breakdown of the internal organism. The vital organs, including the cardiovascular and renal systems, already impaired by normal function before the beginning of the period, are subject to rapid degeneration throughout the later years. It may very well be that these degenerative processes are accelerated by earlier infections, but the importance of the bacterial invasion is now overshadowed by the inability of the body to resist decay.

In conclusion, it may be of interest to refer briefly to a few figures indicating the economic status of persons at these advanced ages. It is estimated that one and one quarter million persons in the United States who have reached the age of sixty-five are in want and are supported by charity, public and private. This means that twenty-eight per cent. or, in other words, more than one out of every four, are dependent upon public or private charity. In Massachusetts, where an excellent census was recently completed (1915), it was found that close to 35,000 persons out of a total of 190,000 were the recipients of public or private relief. This constitutes 18.2 per cent. of the total population sixty-five years and over, but this does not include a very large number who received assistance or maintenance from relatives and other unregistered sources.

The economic disability of the aged thus seriously complicates the medical problem. This makes the interest of the community all the more acute. In some foreign countries this interest is expressed in terms of old age pensions or other provision by the state or through agencies encouraged by state subsidies. As interest in the problems of old age in our own country increases, this matter will engross our attention also and will offer for solution a problem not only of the greatest complexity, but one which will give the greatest pleasure in its solution. In the care of the aged we express our altruism in its highest form.

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